

# NICHOLS ENVIRONMENTAL (CANADA) LTD.

## STATEMENT OF QUALIFICATIONS

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<b>Client:</b>	<b>Bulk Fuel Dealer</b>	<b>Project start date:</b>	Apr. 2002
<b>Location:</b>	Alberta	<b>Project end date:</b>	May 2002
<b>Project Type:</b>	Geotechnical Investigation	<b>Project Manager:</b>	M. McCormick
<b>Project Value:</b>	\$3,300		

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**Project Title:**                    **Geotechnical Investigation**

**Project Description:** A commercial bulk fuel storage and cardlock facility is planned for a southern Alberta town. Nichols Environmental was retained to provide geotechnical recommendations for the proposed development. Four engineering options were presented for preparation of the tank foundation, and recommendations were made for the on-site roadway.

Nichols Environmental was retained to provide geotechnical recommendations for a proposed bulk fuel farm, cardlock facility, and service road. The proposed development included the installation of eight (8) 90,000L aboveground storage tanks, containment dyke, associated piping, and loading rack. The loading on the tank area was estimated to be 37 kPa, with a peak pressure below the tank footprint of 88 kPa.

Two deep and five shallow boreholes were drilled. Soil strata were logged and samples were collected for moisture content, organic content, Atterberg Limits, water soluble sulphate concentrations, and soil density. While the soil conditions were favourable to the proposed development, it was necessary that the engineering design consider the presence of a layer of soft clay which underlies the site at a depth of 1.5 to 4.0 m. This silty clay would consolidate under moderate to high loading, causing settlement which might in turn induce piping connection problems.

The four engineering options presented for the tank farm foundation were excavation and removal of the soft clay, installation of driven timber piles below a compacted gravel foundation, use of a flexible piping design to deal with settlement, and preloading of the site to induce settlement prior to construction. Preloading would be accomplished by placing a thick mat of gravel fill over the tank farm area.

For the on-site service road, there was found to be a sufficiently thick layer of stiff clay overlying the soft clay to distribute the truck loading. A moderately thick base course would be sufficient to provide adequate roadway surface.

